

**National Ocean Service
Electronic Mail System Improvement Team**

E-mail Architecture Framework Document

July 1998

Executive Summary

The National Ocean Service (NOS) Email System Improvement Project Team was created to review the existing electronic mail environment in NOS, develop recommendations for addressing current problems, and to develop an architecture for a future NOS email system. The Logistics Management Institute (LMI) report entitled 'Improving Communications: Recommendations for the National Ocean Service E-Mail System' is used as input and will be addressed by this effort. The team will improve the email system in a two-phased approach using Information Management Systems Architecture. The first phase of this project is to consider fixes to the current email system in NOS, the second phase is to plan for the future using systems architecture processes. In order to compress the schedule of this project, the two phases will be conducted with much overlap, and much of the work will be in parallel. Information Management Systems Architecture principles will be used to ensure that the work is carried out in proper organizational and technical context.

This document presents a framework for the email system improvement project. The sections following this summary include assumptions about the project and the NOS organization, objectives of the email system architecture, and processes that must be considered for operating an email system. In preparing this document, a high-level, non-technical approach was taken for review by all stakeholders with a general knowledge of email. Email is a corporate asset, and its operation is of interest to all members. Comments from all stake holders are welcome. A companion to this document, a NOS Email System Improvement Project Plan describes the project concept, deliverables, and other process information. The Project Plan will likely stay in draft for the duration of the project and be revised on a continuous basis. Other planned documents resulting from the work of the project team will present the current baseline/system improvement recommendations, target architecture, and implementation/migration plans. These documents will be prepared as the team completes each phase of the project.

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Overview

The NOS Electronic Mail System Improvement Team desires a unified, seamless electronic mail system which ensures quality communications service throughout the National Ocean Service organization and with NOS partners. The planning process of the email system improvement project team identifies the electronic mail needs of users and the capabilities of all NOS elements. Participation of all offices is key to the success of the project.

The purpose of this document is to describe the dimensions of this project to ensure that all members have a common understanding of the project. The following sections of this document are the vision, assumptions, objectives, and principles of this project. Together, these ideas form the framework for this effort. These ideas are taken from initial meetings of the Operations and Engineering Working Groups as well as the LMI study. The vision statement presents a view of the future of the NOS email system and the goal of this project. The assumptions are the beliefs about the current technical and organizational context for this project. In order for the team to understand its collective approach to the project these assumptions were discussed and are described here. The objectives are included here as high-order requirements. These objectives are the initial form and shape of the architecture, and serve to identify some of the parameters of the system. The principles are the processes and procedures necessary to manage and operate an effective mail system. The information provided within the following sections is meant to facilitate the building of an information management systems target architecture. They establish the framework for the Electronic Mail System Improvements Project.

Vision

To achieve efficient operation in carrying out the NOS mission, the National Ocean Service requires a universally available, reliable electronic mail* system. The target system will promote effective, efficient communications and will integrate seamlessly with NOAA-wide mail systems. Training will be provided and support, operating procedures, and standards will be established to provide the most productive communication tools to support the NOS Mission.

* The team discussed whether the term 'electronic mail' or the alternate term 'electronic messaging' should be used in the vision statement. The difference between these two terms, as understood by the team, is that electronic mail is a specific technique of electronic messaging; and that electronic messaging includes electronic mail as well as other techniques such as calendar/schedule, news servers, bulletin boards, and discussion servers. The team agreed that electronic mail was the specific charge of the team and the subject of electronic mail must be addressed by the team. However, since there is an opportunity to consider these other techniques at this time, the team should consider the broader question of electronic messaging if possible.

Assumptions

The assumptions that follow are described in order to document givens, constraints, or beliefs of the Electronic Mail Improvement Team members as they undertake their mission. If these assumptions change, then the nature of the project would change. If these assumptions are incorrect or improperly drawn, then the project may be misdirected. The purpose of documenting these assumptions at this point is to communicate these ideas and to ensure that the project team is operating within the proper organizational and project context. The team will use these assumptions as truths from which to base their work.

Two phase approach

The Electronic Mail System Improvements Project is being approached as a two-phase effort. The first phase is to identify and address problems with the current systems, the second phase is to create a standards-based architecture for email systems in NOS and to begin migration toward that architecture. Since several offices are interested in migrating to new technology as soon as possible, they may be devoting resources toward the new standards-based architecture and limiting their effort on existing problems. Replacing email systems as resources become available is consistent with the principle of systems architecture, and with improving email services. It is the recommendation of the project team that systems be replaced, not upgraded if they will soon be abandoned.

Senior management support

NOS senior management sponsored the study of the NOS email system by Logistics Management Institute (LMI). Senior management approved the establishment of the email System Improvement Team and the review of the LMI study. The review of the study will provide recommendations for improving the current email and for the development of the architecture of a new system. The NOS senior management expects an integrated email system that facilitates teamwork within our organization and with our partners.

High expectations

The increasing technical knowledge and awareness of email systems by NOS staff establishes a higher standard than before. Competition in the private sector of improving technologies has significantly increased email functionality and coverage within NOS and among our partners. All components of the organization rely heavily on email to provide a vehicle for doing the bulk of their communicating and are counting on the email system improvements team to deliver recommendations for a reliable high quality email solution.

Talent/experience

NOS is technologically well-positioned for the transition to the future architecture because of the talent and experience within the organization. This talent has experienced and facilitated many changes over the years. Operationally and technically, NOS possesses expertise in a broad spectrum of email methodologies assuring the likelihood of success in establishing a solid target architecture. The organization will capitalize on their expertise to ensure that improvements to the existing email system are implemented and future plans are technically sound.

Team commitment

The Email system improvements team is composed of a group of highly qualified professionals from the field offices as well as headquarters staff, who are committed to the success of the project. With active participation, positive attitudes, acceptance of contributions offered by NOS staff, cooperation with other team members and NOS staff, and the adoption of NOS's requirements as a whole, accomplishment of the project is assured. These elements will be reinforced in team projects.

Cooperation with NOAA networking plans and procedures and other government policy

NOS will cooperate with NOAA Information Technology staff in developing and implementing email system networking plans and procedures. NOS will conform with Department of Commerce, NOAA, and other applicable government policies. An effort will be made to ensure full cooperation within the organization and other government entities with ongoing and future initiatives for network plans, policies, and procedures.

Infrastructure must be able to support the system

An infrastructure supporting the email target architecture is required for the system to be successful. The email team will work to design a system that supports current mid-level computing/networking capability. Consideration will be made for low-end users with limited operating system capabilities and geographically dispersed sites with limited bandwidth available; however, it may be the recommendation of the project team that NOS staff at all levels improve their portion of the infrastructure (e.g., PCs, networks) to ensure that improvements to the NOS mail system can be implemented throughout the organization.

Maintain current core capability

Current capability will be depicted in a baseline characterization for the target architecture. The baseline characterization will provide the minimum requirements for the technical and operational aspects of the target architecture. Any improvement to the email system must preserve the minimum requirements for all NOS offices.

All current systems are on the table

NOS is in need of email system improvements. The project team is in agreement that all existing email systems could potentially be replaced, modified or used as a component in the new email system derived from the target architecture. In the case of current functionally acceptable email systems, additional methodologies will be considered as viable solutions to meet cross organizational requirements in developing a reliable cohesive email system for the organization.

The NOAA Mail*Hub as the authoritative NOAA mail directory

NOS will use the NOAA Mail Hub as part of the NOAA mail directory. NOAA currently provides directory services and support for those services. This greatly reduces the administrative and financial overhead required if NOS attempted to reproduce similar services. NOS will not duplicate the effort in place through the Mail Hub initiative and will abide by the policies and procedures for the Mail Hub.

Recommendations based on technical/operational criteria

In the second phase of this project, solutions for email system improvements will be presented based upon recommendations by the operational and technical teams. Recommendations for improvements will be based on a combination of both technical and operational criteria to meet the administrative, support and functional requirements of the agency's mission.

Objectives

The objectives formulate a blueprint for the subsequent steps in the project. They are high-level requirements, goals, and themes of the Electronic Mail Improvement Team. These objectives will be used to frame the project, to set the scope, and to structure the project. The objectives will be used to structure an architecture which meets the needs of the organization.

Open systems/Standards based

To take full advantage of current standards whenever and wherever possible, and monitor standards development for future growth.

Provide an integrated system with compatible components

The improved email system should be consistent among all NOS components, transparent to mobile users or users moving across the organization, and reliable without imposing unreasonable burdens on any one organizational entity/workgroup.

Universally available Email system

Email should be available where and when it is needed. Regardless of station or assignment, if a NOS person has a requirement for email to carry out the mission of the organization, they should be able to utilize the email system.

Scalable - Individual/Local/Enterprise (NOS)/Corporate (NOAA)/Internet

The email system should be client and server independent. The system should be scalable to the current organization's needs as well as be expandable for future growth. All system components should service the individual, work group, enterprise, or corporate aspect of the organization.

Email System requirements

The Email system should have robust features to satisfy all needs of addressing, editing, and reliable transport. Requirements identified thus far include: attachment handling (format, size and printing); establishment of a delivery time expectation; shared mail capabilities; archival requirements, and security requirements.

Minimize impact and instill comfort

To ensure effective use of the current system and a smooth transition to new email technology, a training plan will be developed for all potential users and support personnel to be efficient with the new system. The plan should include an initial training session coordinated with system changes or implementations and also include continued training for users and administrators through upgrades, changes and future planning. In addition to training, an impact statement and migration plan should be provided to all proposed email administrators and users.

24x7 availability and reliability

The goal of the NOS Email system is to provide continuous operation and availability 24 hours a day and seven days a week. Providing the best possible service should be the ultimate goal of the project. Due to the nature of the NOS mission, any individual may be required to utilize email from anywhere at anytime.

Easy-to-use and robust directory services

Users should be able to easily find a NOAA person's email address, should have an up-to-date directory, and should be able to use organizational mail lists. Users should have other directory services provided easily through their mail system including personal address books and personal mail lists. Robust directory services should be seamless in their availability and use and should be well integrated with the email system. Entities within the organization should have the capability to incorporate local mail lists and temporary users within their local Directory services. Group addressing or mail list capability is required and should be considered as a component of the directory services requirements.

Support Email enabled processes

The work process of some offices in NOS have integrated proprietary email system features into specific communications tasks. The objective of defining a standards-based Email system architecture may seem incompatible with support for currently operated proprietary Email systems with nonstandard features. In addressing this situation, the Email System Improvement Team should work to understand the needs of offices with work processes that currently use proprietary solutions. A solution should be sought that preserves the effectiveness of the current work processes and supports the NOS need to have a seamless email system.

Provide a portable client with a common transient interface

NOS staff in travel status require the use of a portable email client. A great number of users are required to be mobile to accomplish their work and require email access. To effectively use the system, a common interface should exist providing the same capability to users when mobile.

Provide an Enterprise/Corporate level 1-800 access for mobile users

A 1-800 dial-in access service should be provided for mobile users. Currently, dial-in access is available to mobile users through many sites. Many problems exist with utilizing local numbers (e.g., hotel room charges, confusing dial-in sequences, etc.) and typically, the expense and upkeep of dial-in capability and 1-800 numbers is too steep for the smaller sites to make the investment. As a result many NOS staff with a dial-in need are currently without this capability. The email project team will examine an efficient and cost-effective method for 1-800 access.

Principles

The following principles are processes or courses of action identified by the project team as necessary to design, implement, and administer the NOS email system. These principles describe activities that must be accomplished to ensure the email system meets the needs of the users, stays technologically current, and continues to improve communication for our agency.

Manage as an Agency resource

The email system is a critical resource. Management, operational, and oversight processes should be established so that the email system stays integrated with organizational requirements and promotes good communication.

Adaptable, iterative

The email system will adapt to organizational changes, new and evolving technology standards, techniques, and new email requirements. The project team will review these two aspects in an effort to keep a current system that is fluid and coherent with the organization and remains reliable.

Compatibility with field offices

NOS's field offices are of various sizes located in widely dispersed areas. This requirement presents particular problems of compatibility. NOS must develop processes to ensure that all mail systems work together as a compatible and coordinated whole. These processes include cooperative planning, policies, operations, and periodic review.

Migration

The Electronic Mail System Implementation Project team should have a migratory path for future information technology planning. This migratory path will ensure minimal disruption both individually and organizationally and develop flexibility to adjust to future changes in mail including archiving. As technology changes, define an acceptable migratory path to ensure the efficiency of the email system.

Compatibility with partners

NOS works closely with many external partners in carrying out mission goals. Partners include all of our constituents such as government agencies, universities, industry, science and educational institutions, and public groups. NOS must build an information management systems architecture to ensure effective communication with our partners. As technologies change, our gateways should be monitored to ensure proper operation. We can extend professional technical teamwork in identifying and resolving network related problems that arise.

Develop an automated directory synchronization process

NOS relies on the integrity of the NOAA X.500 Directory. In order to improve the NOAA entries in this directory, ensure that our mail systems receive current data from this directory, reduce administrative overhead, and minimize human intervention, NOS must develop and utilize automated directory synchronization processes.

Training plan

A process should be established with a comprehensive training plan to ensure all users and administrators remain effective and efficient in the use and support of the system. Training is essential to keep current in owned technologies and upgrades, emerging standards, security measures, emerging policy issues in email. New user training should be incorporated with new employee orientation procedures to ensure new employees are provided with an appropriate level of training. Documentation of unique aspects of NOAA/NOS mail systems and documentation of NOS email policies and visibility of the documentation should be included in the training plan.

Build and advertise effective/efficient support structure

Standard Operating Procedures (SOPs) will be established for all offices in NOS to ensure proper notification to users in cases of email receipt and transmission disruptions and/or scheduled down-times. The SOPs will also include information for administrators and users on problem reporting and escalation of reporting procedures.

Operating procedures for remote users

A simple procedure should be developed to assist mobile users in the utilization of the email system via dial-in or direct internet-connection.

Open systems/Open standards

A process should be established for monitoring emerging industry standards, adopting new standards, and measuring compliance with standards. The standards supported by the email system and a collection of white papers on standards will be developed and compiled into a NOS electronically available library.

Naming conventions

A naming convention policy and procedure should be established. Following naming conventions in disparate networks will ease the burden of administering directory services. Adherence to current standard naming conventions established by NOAA for enterprise-wide directory services should be incorporated with this policy.